Ennerdale Rural District

ANNUAL REPORT

OF THE

MEDICAL OFFICER OF HEALTH

FOR THE YEAR 1958

AND REPORT OF THE

CHIEF PUBLIC HEALTH INSPECTOR

ENNERDALE RURAL DISTRICT COUNCIL
HEALTH AND HOUSING COMMITTEE
1958 - 59.

Chairman ..... Councillor J. Noctor

Member ex-officio:

The Chairman of the Council—Councillor J. Cook.

Members: Councillors F. B. Benson, O. J. Coyles, G. Farran, W. Hannah, J. E. High, Rev. F. K. McCann, T. J. Rawling, W. Roe, J. B. Stalker, F. Telfer, A. Threlfell.
Cllr. H. J. Branney (died 10th March, 1959).

HEALTH DEPARTMENT STAFF

Medical Officer of Health:

J. N. Dobson, M.B., CH.B., D.P.H.

Chief Public Health Inspector:

*† J. Buttery, C.R.S.I.

Senior Additional Public Health Inspector:

* R. M. Howells, C.R.S.I.

Additional Public Health Inspector:

* W. Murray, C.R.S.I. (*Appointed* 1/11/58)

Clerk:

Miss I. Davidson.

(*Joint appointment with Whitehaven Borough*).

Clerk-Typist: Miss I. G. Benn.

* Certificate of Meat and other Food Royal Society of Health.
† Certificate in Sanitary Science as applied to Buildings and Public Works.

Tel:
Whitehaven 661.

Health Department,
53, *Duke Street,*
Whitehaven.

To the Chairman and Members of the
Ennerdale Rural District Council.

Mr. Chairman, Councillor Mrs. McPoland and Gentlemen,

The introduction to the annual report of the medical officer of health appears first but is usually written last. This may explain the ease with which it becomes translated into nothing more than a summary of the year's fortune, good or ill. It is doubtful indeed whether a preface is necessary at all, but its traditional inclusion does allow space to say that which cannot conveniently be put in the report itself.

To summarise the report in a few words one may say that the health of the District appears to be good, and not only good but improving. The one exception to this is the increasing number of deaths from lung cancer, not just a local concern but a grave national problem.

General satisfaction however should not obscure the existence of certain sanitary shortcomings which, in the field of sewerage particularly, present ever more pressing difficulties. While these matters are currently receiving attention, certain delays are quite unavoidable and it is easy for schemes to lose impetus in consequence. We should never lose sight of the fact that good sanitary engineering is vital to good community health.

In the previous report mention was made of the arrears of slum clearance and the aggravation of this problem due to shortage of staff. Towards the end of the year Mr. W. Murray was appointed as additional public health inspector and it was possible to devote more attention to slum clearance work. Though not appearing in this report, this work has already borne fruit.

The Council's mass radiography campaign has been described in some detail. not least because the efforts of the Campaign Committee and their voluntary helpers

merit it. It is not possible to mention all those who supported the campaign in many different ways, but the services of Councillor J. R. Gilbertson, who gave his time unstintingly to the exacting position of Chairman, are specially deserving of acknowledgment.

The final campaign results have not previously been reported and, in addition to being more successful than at first appeared. they throw additional light on the position as regards tuberculosis in the District and emphasize anew the particular difficulties facing the chest physicians and medical director of the mass radiography unit.

In matters of health generally, acknowledgment must be made of the interest of all Members of the Council, while the increasing demands of the year's work on the Health and Housing Committee have been met with unfailing attention. It is a pleasure also to thank fellow members of the staff for their willing co-operation with the Health Department.

I am, Mr. Chairman, Madam and Gentlemen,

Your obedient Servant,

J. N. Dobson,

Medical Officer of Health.

SECTION A.
STATISTICAL SUMMARY

I.—General Statistics.

Area of Rural District in acres	88,730
Population (Registrar-General's estimate, mid-year, 1958)	29,050
Persons per acre	0.33
Number of inhabited houses, 1958-1959, according to rate books	9,206
Rateable Value	£212,530
Product of a Penny Rate	£804

VITAL STATISTICS

Births :—

(a) Live Births	Males	Females	Total
Legitimate ...	278	273	551
Illegitimate ...	7	7	14
Total ...	285	280	565

Crude Birth Rate per 1,000 of population ...	19.5
Adjusted Birth Rate	19.6

(b) Still Births	Males	Females	Total
Legitimate ...	5	4	9
Illegitimate ...	1	—	1
Total ...	6	4	10

Still Birth Rate (per 1,000 total births) ...	17.7

Deaths :—

	Males	Females	Total
Deaths (all ages)	172	144	316

Crude Death Rate per 1,000 of population	10.9
Adjusted Death Rate	13.1
Deaths from Pregnancy, Childbirth and Abortion ...	Nil

Death Rate of Infants under 1 Year of Age

All Infants per 1,000 live births	21.2
Legitimate Infants per 1,000 legitimate live births	21.8
Illegitimate Infants per 1,000 illegitimate live births	Nil

The following table is given for comparison of certain vital statistics.

TABLE 1.

Comparative Statistics

	Birth Rate	Death Rate	Infant Mortality Rate
Ennerdale R.D.	19.5	10.9	21.2
Cumberland (Administrative County) ...	17.6	12.1	28.2
England and Wales	16.4	11.7	22.5

Table 1 summarises the basic figures for the year which, as in the previous year, are very satisfactory. The general death rate remained low, and the infant mortality rate was the lowest ever experienced by the District. The local birth rate continues to be higher than the national figure, as Table 2 shows.

TABLE 2.

Birth Rates

Year	Number of Births	Birth Rate per 1,000 of population : Ennerdale R.D.	England & Wales
1954	... 503	18.0	15.2
1955	... 525	18.6	15.0
1956	... 557	19.7	15.6
1957	... 608	21.2	16.1
1958	... 565	19.6	16.4

Table 3 shows death rates over the past five years.

TABLE 3.

Death Rates

Year	Number of Deaths	Death Rate per 1,000 of population : Ennerdale R.D.	England & Wales
1954	... 336	13.1	11.3
1955	... 316	12.3	11.7
1956	... 335	14.0	11.7
1957	... 286	11.9	11.5
1958	... 316	13.1	11.7

The slight increase in death rate is due almost entirely to diseases of the heart and blood vessels which rose from 124 in 1957 to 164 in 1958. Otherwise there were no notable changes in the numbers of deaths as classified by the Registrar General. Cancer deaths, including those of cancer of the lung, remained about the same. There were somewhat fewer accidental deaths, one pleasant feature indeed being the total absence of deaths on the road.

Infectious disease, other than tuberculosis, accounted for but one death, which was caused by influenza. Tuberculosis is given as the cause of six deaths, though it appears from the death certificates to have been no more than a contributory cause in two of them.

No deaths took place from maternal causes. The maternal mortality rate for England and Wales in 1958 was 0.43 deaths per 1,000 total live and still-births..

Infant Mortality rates are given in Table 4, and causes of death in Table 5.

TABLE 4.

Infant Death Rate

Year	Number of Infant Deaths	Death Rate per 1,000 live births : Ennerdale R.D.	England & Wales
1954 ...	18	36	26
1955 ..	20	38	25
1956	16	29	24
1957 ...	16	26	23
1958 ...	12	21	23

In 1958 the District was spared the usual number of infant deaths due to prematurity, and this resulted in a record low infant mortality rate. Half of the twelve deaths which took place under the age of one year were the direct result of congenital malformation. Only two deaths occurred between the age of one month and one year one of which was due directly to this cause. Underlying the immediate cause of the other were congenital defects also, so that malformations were, in fact, associated with seven deaths.

Coupled with low infant mortality there was a low still-birth rate also, one which has been previously equalled but never bettered. All in all this was an exceptional year for infant survival, one which prompted a look back at earlier reports. We find that only thirty six years ago Dr. John Clark, medical officer of health of Cleator Moor, remarked that the infant death rate was more than double that of England and Wales "which is most appalling." Indeed it was, for a similar infant death rate to-day would have caused 94 deaths in the District amongst children under one year of age. Dr. Clark would have been pleased, perhaps incredulous, to know that in 1958 infant deaths would average no more than one a month.

TABLE 5.

Deaths of Infants Under 1 Year of Age

Cause of Death	Age in Weeks 0—	1—	2—	3—	Age in Months 1—	3—	6—	9—	Totals
Prematurity	2	—	—	—	—	—	—	—	2
Congenital malformations	4	—	1	—	—	1	—	—	6
Atalectasis	1	—	—	—	—	—	—	—	1
Birth injury	2	—	—	—	—	—	—	—	2
Pyelonephritis	—	—	—	—	—	—	1	—	1
	Under 1 month				Over 1 month				
Total deaths	10				2				12

Cancer Mortality.

There were 46 deaths from cancer, the primary sites of the lesions being shown in Table 6.

TABLE 6.

Deaths from Cancer.

Location of Disease	Male	Female	Total
Oesophagus	—	1	1
Stomach	10	1	11
Colon	1	3	4
Rectum	1	1	2
Pancreas	1	—	1
Lung and Bronchus ...	10	1	11
Uterus	—	3	3
Breast	—	6	6
Ovary	—	2	2
Prostate	1	—	1
Other sites	1	3	4
	25	21	46

With the exception of deaths from cancer of the lung and bronchus there are the usual random variations in cancer deaths. In the 1957 annual report mention was made of the local increase in lung cancer deaths, and the additional vulnerability of the District owing to the prevalence of sidero-silicosis which is thought to be a predisposing factor.

There is no improvement in the year under review and the following tables emphasizes the increase which is occurring. Four five-year periods are compared, total cancer deaths being given in parenthesis, while deaths from respiratory tuberculosis are shown as a welcome contrast.

TABLE 7.

Deaths by five-year periods

Cause	1939 - 43	1944 - 48	1949 - 53	1954 - 58
Cancer of lung and Bronchus	12 (221)	16 (203)	31 (253)	47 (251)
Respiratory tuberculosis	134	128	78	27

In round terms, deaths from tuberculosis of the lung are one fifth of what they were twenty years ago, while lung cancer deaths are four times greater over the same period. Nor is there any sign of a slowing down in the cancer epidemic. While each year adds to our knowledge of this particular condition, and factors other than smoking undoubtedly play a part, it has to be said yet again that the biggest single cause is over-use of tobacco. Whatever reasons we find for continuing our own smoking there is certainly no hardship to youngsters in preventing them from starting the habit. The words "cancer" and "death" mean nothing to schoolchildren; to their parents, who are rather better informed, the sight of their children growing to enjoy cigarette smoking should be nothing short of alarming.

Despite increasing deaths from lung cancer the total cancer death rate continues to compare favourably with that for England and Wales, as can be seen from Table 8.

TABLE 8.

Cancer Death Rates

Year	Number of Deaths	Annual Death Rate per 1,000 of population : Ennerdale R.D.	England & Wales
1954	.. 44	1.54	2.04
1955	... 60	2.09	2.06
1956	... 51	1.76	2.07
1957	... 50	1.73	2.09
1958	... 48	1.65	2.12

TABLE 9.

CAUSES OF DEATH DURING THE YEAR 1958.

Registrar-General's Classification

	Males	Females
Tuberculosis of Respiratory System ...	4	—
Other Tuberculous Diseases ...	1	1
Syphilitic Disease	1	—
Diptheria	—	—
Whooping Cough	—	—
Meningococcal infections	1	—
Acute Poliomyelitis	—	—
Measles	—	—
Other infective and parastic diseases ...	1	—
Malignant neoplasm, stomach ...	10	1
Malignant neoplasm, lung and bronchus	10	1
Malignant neoplasm, breast ...	—	6
Malignant neoplasm, uterus ...	—	3
Other malignant & lymphatic neoplasms	6	11
Leukaemia, aleukaemia	—	1
Diabetes	3	2
Vascular lesions of nervous system...	19	36
Coronary disease, angina	33	20
Hypertension with heart disease ...	1	3
Other heart disease	17	9
Other circulatory disease	12	14
Influenza	1	—
Pneumonia	6	5
Bronchitis	2	3
Other diseases of respiratory system ...	10	1
Ulcer of stomach and duodenum ...	2	—
Gastritis, enteritis and diarrhoea ...	—	—
Nephritis and nephrosis	2	1
Hyperplasia of prostate	4	—
Pregnancy, childbirth, abortion ...	—	—
Congenital malformations	1	5
Other defined and ill-defined diseases	17	20
Motor vehicle accidents	—	—
All other accidents	7	1
Suicide	1	—
Homicide and operations of war ...	—	—
Total (all causes) ...	172	144
	316	

SECTION B.

GENERAL PROVISION OF HEALTH SERVICES.

(a) Staff

Changes in staff are shown on page 1 of the report.

(b) Laboratory Facilities

Use is made of the bacteriological facilities at Whitehaven Hospital under the direction of Dr. A. C. F. Ogilvie, and of the Public Health Laboratory Service at the Cumberland Infirmary directed by Dr. D. G. Davies. Analytical services are provided by Messrs. Ruddock and Sherratt, Public Analysts, Warrington.

(c) Local Health Authority Services

Medical services provided under Part III. of the National Health Service Act are the responsibility of the Cumberland County Council. Information about the provision of Home Nursing, Home Helps, Immunisation and other services is available at the office of the Senior Assistant County Medical Officer, 102, Scotch Street, Whitehaven.

Clinics are held as follows :—

	Frizington	Cleator Moor	Egremont
School Clinic	Mon. 9-30 a.m.	Thurs. 9-30 a.m.	Thurs. 9-30 a.m.
Child Welfare	Mon. 2-00 p.m.	Thurs. 2-00 p.m.	Thurs. 2-00 p.m.
Ante-Natal	Wed. 2-00 p.m.		
Dental	Tue. 9-30 a.m.	Wed. 2-00 p.m.	Mon. 9-30 a.m.

A number of ante-natal clinics are conducted by general practitioners in conjunction with the district midwife.

Appointments may be made through the School Clinics for attendance at the following special clinics :—

Ophthalmic, Ear, Nose and Throat, Orthopaedic, at Sandhills Lane Clinic, Whitehaven.

Child Guidance, at 10, Scotch Street, Whitehaven.

Speech Therapy, at Cleator Moor and Egremont Clinics.

Orthoptic treatment at Whitehaven Hospital.

In addition to the provision of clinics and routine medical inspection the School Health Service now tests the hearing of all children on admission to school. The County Council employs a teacher of the deaf as well as the necessary audiometricians.

The Occupation Centre, Flatt Walks. has 40 places for mentally backword children.

(d) Hospital Services

Facilities provided by the Regional Hospital Board include Whitehaven Hospital, Flatt Walks : 122 beds. General hospital services. General practitioners have X-ray facilities directly available.

Homewood Annexe has 41 beds for tuberculosis and diseases of the chest.

The Hollins, Hensingham : 31 beds. Pre-convalescent and chronic sick, with a small number of antenatal beds.

Galemire, Cleator Moor : Infectious diseases hospital with 24 beds, some of which are available for medical cases.

The Chest Clinic serving the area is in St. Bridget's Lane, Egremont

Part III. hospital accomodation is available in Meadow View House, Whitehaven (31 beds), by joint user agreement with Cumberland County Council.

(e) National Assistance Acts.

Three women were removed to hospital under the provisions of the National Assistance Acts. One was eighty two years old, physically and mentally incapacitated and left suddenly uncared for through the illness of a housekeeper. Another, of 93 years, had become a burden to her granddaughter who, to her credit, had taken her in to her own home when several daughters had refused to care for their mother. The old lady was returned somewhat precipitately to her own home however and, in effect, the medical officer told to get on with doing something. Though she was obviously dying there was no alternative to getting her into hospital, where she survived for only two days. Fortunately she was unable to comprehend the circumstances surrounding her return. home.

The third case was of an elderly woman with paralysis agitans; quite unable to look after herself in any way, she was being cared for by her husband who suffers from delusions. She had been virtually a prisoner in her bedroom for three years without visitors, being able to read, or hear the radio. In fact she was failing for lack of nursing care though her husband looked after her in his own way and was devoted to her. The house was appallingly filthy.

Despite the husband's objections the patient was removed to hospital. Although she lived for only four four months, she regained some of her lost powers in that time and brightened up considerably.

(f) Problem Families.

Of the fourteen cases of children neglected or ill-treated in their own homes which were considered during year, the Children Neglected in their Own Homes Committee were able to close five.

A special effort was made to help one of the remainder, this family consisting of parents and children of ten, six, three and one and a half years. Although the husband was employed, and income adequate, the wife was feckless and a bad manager. Added to this the house, in a clearance area, was in a very bad condition.

Through the aegis of the County Council the mother and the two youngest children were admitted to Brentwood recuperative centre in the Spring and matters so arranged that after ten weeks they returned to a new Council house. Before and after this operation they were closely supervised by the N.S.P.C.C. Woman Visitor.

Unhappily the mother was incorrigible and although of fair intelligence could not, or would not, keep the house in reasonable order and pay the rent. After ten months the Housing Association managing the house were obliged to get an eviction order, the mother and children entering national assistance accommodation as a result. Even there the woman refused instructions and would not keep the children clean.

This case represents an interesting and, one hopes, unusual failure. Nothing seemed able to shake the mother's idleness, dis-interest and irresponsibility. Strange to say the children, though wildly behaved, were satisfactorily nourished and very fond of their parents. One cannot help wondering what their future will be.

SECTION C.

SANITARY CIRCUMSTANCES OF THE AREA

A report by the Public Health Inspector on the work of the year has been submitted and will be found at the end of this report.

Water Supplies.

A balancing reservoir (capacity 50,000 gallons) was constructed during the year to improve the distribution to the southern end of St. Bees.

Increased demand for water in the Distington area resulted in shortage in Lowca, affecting Lowca school in particular. Distington and Lowca at present share a supply through the Gilgarran break pressure tank and Boonwood reservoir; the former is 76ft. higher than the latter which is not fully utilised. It is proposed to lay new distribution mains so that Distington will make full use of the Boonwood supply, the isolation of which will improve the pressure in the Lowca main.

Sewerage.

Norbeck Sewage Works, Cleator Moor.

It was reported by the consultant engineers that these works are overloaded to three and a half times their capacity, and enlargement and improvements were suggested. Apart from discussions with the County Sewage Engineer no progress was made with this problem during the year. It was decided that a survey of all the Council's sewage works should be undertaken and a report made on the works necessary to bring them to a satisfactory standard.

Egremont Sewerage—Braystones outfall.

To reduce the load on the surcharged Braystones sewer, and reduce pollution of the River Ehen by discharge from storm overflows, the consultant engineers proposed the construction of settlement tanks at Picket How.

This would be part of the second stage of the modifications required to relieve flooding in the trunk sewer, the remainder comprising mainly renewal of part of the main sewer and re-construction of the derelict sea outfall.

Limited progress was made with the first stage, construction of a storm overflow at Bridge End, Egremont.

SECTION D.
PREVALENCE OF, AND CONTROL OVER, INFECTIOUS DISEASES

Notifications, other than those of tuberculosis, are shown in Table 10.

TABLE 10.
Infectious Disease Notifications

Disease	No. of cases notified	Admitted to Hospital	Died
Scarlet Fever	21	—	—
Puerperal pyrexia	—	—	—
Acute primary pneumonia ...	5	1	—
Erysipelas	1	—	—
Cerebro-spinal meningitis ...	1	1	—
Poliomyelitis, paralytic ...	1	—	—
Poliomyelitis, non-paralytic	—	—	—
Measles	33	—	—
Whooping Cough	4	—	—
Dysentery	9	1	—

Tuberculosis apart, there were no deaths from notifiable infectious disease in 1958. Furthermore, the three cases shown in Table 10 as having been admitted to hospital went to either Workington or Whitehaven, and no notifiable cases were admitted to Galemire Hospital. Galemire, indeed, was virtually unused for infectious disease cases. although one case of chicken pox was admitted from the Rural District

The total figures are really very small and mention need be made only of poliomyelitis and dysentery.

The poliomyelitis case occurred in a seventeen year-old girl who had not been immunised. After typical premonitory symptons she developed weakness of the left arm and leg, recovery from which was fairly rapid though a weak hand grip remained for a while. Her twelve year-old sister had had two injections of Salk-type vaccine three months previously and developed no illness, nor did any other case come to light.

Only one adult was affected by dysentery, the mother of two of the cases. The remaining six were scattered four of them being in pre-school children. All the notified cases, save two, occurred in a matter of a fortnight in March indicating epidemicity of a disease from which the area is never quite free. The tendency of this condition to become epidemic during the tenth to fifteenth week of the year has been noted only in the post-war period.

TUBERCULOSIS

Notifications in 1958 were received as follows :—

TABLE 11.
Tuberculosis Notifications

	Respiratory	Non-Respiratory	Total
Male ...	22	2	24
Female ...	14	1	15
Total ...	36	3	39

The incidence of respiratory cases in main age divisions is shown in Table 12.

TABLE 12.
Age Incidence of Pulmonary Tuberculosis

Age in years	0—	15—	35—	55—	Total
Male ...	2	3	7	10	22
Female ...	1	5	8	—	14
Total ...	3	8	15	10	36

Though the number of new cases is the smallest ever notified in the District, the new case rate remains at about twice that for England and Wales. The apparent decline in tuberculosis would have been greater but for the special mass X-ray campaign which discovered 7 of the 36 cases. New case rates are shown in Table 13.

TABLE 13.
Tuberculosis Incidence.

	Ennerdale R.D. (Pop'n 29,050)		England & Wales (Pop'n 45,109,000)	
	New Cases.	Case Rate per 100,000	New Cases.	Case Rate per 100,000
Respiratory ...	36	124	26,576	59
Non-Respiratory ...	3	10	3,741	8

The tuberculosis death rate is also about twice the national rate. Actually the figures involved are quite small, and a very considerable reduction over the years may be seen on referring back to Table 7. The position in the last five years is shown in Table 14.

TABLE 14.

Deaths from Tuberculosis (Rates per million).

	Respiratory Tuberculosis			All forms of Tuberculosis		
	Ennerdale		England & Wales	Ennerdale		England & Wales
Year	No. of Deaths	Death Rate	Death Rate	No. of Deaths	Death Rate	Death Rate
1954	8	280	160 ...	10	350	180
1955	6	210	130 ...	7	240	150
1956	5	170	110 ...	6	210	120
1957	4	140	95 ...	5	170	110
1958	4	138	89 ...	6	206	100

The foregoing Tables offer but the briefest summary of the situation concerning tuberculosis in the District. For most parts of England and Wales notifications of new cases, which had risen after the war, began to fall in 1953. In Cumberland however they were still rising : in 1954-55 with 129 notifications per 100,000 population the rate was the highest of the English administrative counties. Within the County the worst rate was to be found in Ennerdale Rural District.

These facts did not indicate that tuberculosis was on the increase but that the routine methods of detection by contact examination and mass X-ray were uncovering a large infector pool. The probable extent of this could only be guessed but its existence was confirmed by investigations made by the County Medical Officer, Dr. W. H. P. Minto, in 1954. While skin ("Mantoux") testing of children showed that an average of 10% in the County as a whole had already been in contact with tuberculosis by the time they started school, the figure for Frizington, Cleator Moor and Egremont was 17%.

A Mass Radiography Campaign.

The County Health Committee decided that this situation merited a special attack in the form of a mass X-ray campaign. In June 1956 the co-operation of the Regional Hospital Board and the Rural District Council was obtained, and made a campaign a practical possibility, but it was not possible to proceed immediately as the District lacked a permanent medical officer of health at the time. Detailed planning started eventually in 1957 and a Campaign Committee was formed at a meeting in Januray, 1958. In addition to representatives of the County and District Councils there were present members of Civil Defence, Cumberland Friends of Sanatoria Patients, Mothers' Unions, Red Cross, Rotary, Women's Institutes, Women's Voluntary Service, and Townswomen's Guilds. Subsequent meetings showed a well-sustained interest and enthusiasm which was a great credit to the public-spirited people who took part.

The Plan of the Campaign.

It was agreed that the approach to the public, supplemented by the general publicity, should be in the form of a circular letter from the Campaign Committee Chairman to every household covered by the survey. This would introduce the campaign, seek information by pre-paid reply forms for the purpose of compiling a census, and ask everyone to state whether they were agreeable to being X-rayed. Voluntary helpers would be asked to collect unreturned forms and would pay reminder visits to persons who, though willing to be X-rayed, for one reason or another failed to attend the Unit.

The Unit would make a street-by-street progression in the eight weeks allotted for the survey. Eighty-five street halts were scheduled. There were five on each street operating day, starting at 1 p.m. and going on till 8-30 p.m. to give every facility to persons at work or on shift work. Street sessions were interspersed with static sessions at various central points, which not only gave an additional opportunity to the general public, but were required for those who had needed reminder visits.

Publicity.

Publicity measures included the distribution of N.A.P.T. leaflets on mass radiography along with the

letters to each household, posters displayed in shops and public houses, libraries and clinics, and press advertisements giving details of the time and place of the Unit's sessions. Cinemas in the three principal areas covered gave free screen time to documentary films on mass radiography, and talks were given to some of the organisations taking part. The clergy were asked to make mention of the campaign at the appropriate time in their area, and general practitioners were approached for co-operation.

Census Returns.

The census was an administrative task to which the addressing of five and a half thousand letters was only a prelude. 31% of the letter-forms were returned by post. Each of the 151 voluntary helpers was then provided with a list of houses from which there was no reply, and as a result of their visits a further 30% of the forms were recovered.

This was extremely creditable in view of the fact that the number of helpers, great as it may seem, was never within sight of the number required to take a census. Only those who have done the work can appreciate its exacting nature. Even after deducting the houses from which letters were returned by post each helper, on average, was responsible for visiting 26 houses. That was before the Unit's visit. Afterwards, a proportion varying according to local response had to be revisited quickly so that reminders could be given or notice cards left in good time before the Unit left the parish concerned.

It was not possible during the campaign to analyse the returned letters in detail. They went first to the medical officer for the compilation of visiting lists, then to the Unit so that attenders could be marked off, thence back to the helpers to show where revisits were needed. There was an opportunity, however, to examine returns from Moor Row and Thornhill, which are comparable in size but contrast in other ways. In Moor Row 23% of those who replied refused to be X-rayed, while in Thornhill the proportion was 27%. These samples, totalling 838 replies, are large enough to warrant the suggestion that generally a quarter of those replying refused X-ray. It is a fair supposition that of those who failed to reply at least the same proportion also would have refused, perhaps more. On

that basis not less than 25% of the population approached were opposed to X-ray.

The Street Survey.

Some provision has to be made for the documentation of attenders. Fortunately the County Civil Defence Committee provided a van which was the indispensable mobile office. Also provided was a loudspeaker unit, and a broadcast tour was made at each halt to announce the arrival of the M.M.R. Unit.

Naturally attendances were influenced by weather, and the opening weeks of the campaign in April were inauspicious. Heavy rains, and gales on occasion, had an adverse effect on the earlier part of the survey. Despite that, the Unit staff were fairly well extended for, in addition to the usual card of particulars to be filled in for each attender, the census forms had to be traced, marked, and sorted for return to the voluntary helpers for the follow-up work. Film reading kept step with the survey, so that clearance letters and recalls for large films could be despatched quickly. This is very necessary to avoid needless anxiety.

Attendance.

In the absence of a complete census the estimated population of the area covered by the survey can be nothing more than a reasonable guess. The method employed, given in the appendix to this account, gives a population of 13,522 persons of fifteen years and over. For statistical reasons which need not be mentioned here, this is likely to be an overestimate if anything. An attendance of 5,917 during the survey is 44% of that population. While less than the number hoped for, it compares favourably with the achievements of many authorities who have carried out X-ray campaigns.

Furthermore, many refusals to be examined were made on the grounds of recent or annual X-ray at work. The establishment chiefly concerned is the Atomic Energy Authority whose Senior Works Medical Officer ascertained the number of employees living in the survey area who had an annual chest X-ray. These numbered 1,269. so that 9% of the target population were accounted for independently of the survey in 1958.

The aim most to be desired of course was to reach people who had never previously been X-rayed. 2,186 attenders fell into this category. i.e. 36% were being examined for the first time. The response in men over 60 was very disappointing but the over-45 group as a whole was fairly represented. This age group comprised 34% of the rural district population of Cumberland at the 1951 census. and it provided 35% of the persons examined in the survey.

Presumably new attenders will continue to emerge in the younger age groups at future visits of the M.M.R. Unit, but there seems small likelihood of persuading many more to come forward in the older groups. The reasons for this are only partly known. In recent years there have been several attempts to investigate reluctance to be X-rayed. and the following findings offer a partial explanation. In one survey 10% of the people said they would prefer not to know they had tuberculosis, while more than one third thought it impossible to have the disease and not feel ill in some way. Fear of the result of examination in some, and conviction that X-ray is unnecessary in others, explain many refusals.

Nevertheless the proportion of population positively refusing examination in the Ennerdale survey was about a quarter, which seems unusually high. Here, however, fear of a disease which has been disastrously prevalent as long as local records exist is linked with fear of unemployment. To men who lived through the hungry thirties in a scheduled Depressed Area. unemployment is never to be forgotten. The difficulty of regaining one's job after relinquishing it for many months is a deterrent to mass radiography which cannot be ignored. The type of employment available in the area makes for difficulties also in re-settlement after treatment. It is sometimes difficult to transfer a man from heavy work to lighter duties with his own employer, sometimes impossible. Special attention is given to this problem and, of the registered disabled persons in Ennerdale Rural District, only 3% are unemployed as a result of respiratory disease.

Results of the Survey.

TABLE 15.

Results of 1958 Mass X-ray Survey.

Number of miniature films	5,917
Recalled to Unit for large film investigation	385
Asked to attend Chest Clinic for further investigation	73
Active tuberculosis	7
Inactive tuberculosis, require supervision (new cases)	16
Pneumoconiosis (new cases)	42
Cancer of lung	—
Bronchiectasis (new cases)	3

An abbreviated summary of the results is shown in Table 15. This has been amended to include two notified patients who stated, on being visited after the campaign, that they had been discovered as a result of attending the special survey. The consultant chest physician verified these cases, so that the final figure was 7 active cases among the 5,917 persons examined.

At first sight this seems a small fraction of the 36 confirmed notifications received during the year, and a poor reward for a special campaign. However, 11 of the notifications derived from patients discovered before the campaign began, while 3 lived in areas not covered by the survey. A further 7 were already under surveillance at the Chest Clinic, of whom five were pneumoconiosis cases, one was a contact and one a patient placed under surveillance as a result of mass radiograhpy in the previous year. None of these would be expected to attend at the street surveys.

This leaves 15 cases, from the start of the campaign at the end of April to 31st December, who, one might think, could have been discovered as a result of the campaign. Indeed, as already stated, 7 of them were, and the number might well have been 8. A young woman took part in the survey in May and received a clearance letter; seven months later a chest film taken ante-natally showed tuberculosis.

Another notified patient, a man of 71, died before the follow-up visits were made and the reason for his non-participation in the survey is unknown. There remained 6 cases who had not been X-rayed during the campaign. Two women patients said they just didn't bother to attend; they, and a man who said he had not heard of the campaign, had never had a chest X-ray. Another man claimed he was at work till after the van left his street. His only chest X-ray was taken some years previously in the Forces.

Two patients could not be expected to have been X-rayed during the campaign period. One was a man X-rayed at work a month before the campaign. Six months later he developed chest pain and was subsequently notified. The other was a girl who had a satisfactory mass X-ray film in December, 1957, yet who was discovered to have tuberculosis when she applied to become a nurse in December 1958. It is plain that a satisfactory chest X-ray taken a year or more ago can offer little reassurance against the presence of tuberculosis.

To sum up, of the 36 notifications during 1958, 15 were potential survey discoveries. Ten of the 15 had either taken part in the survey or been X-rayed within the five months preceding the survey.

As a case finding procedure, then, success was perhaps rather greater than at first appeared. Furthermore, one of the discoveries was a food handler and another a hairdresser; the desirability of finding and treating patients such as these needs no emphasis.

In analysing the results prominence has naturally been given to tuberculosis which was the target of the campaign, and it will be seen that 16 new cases of inactive tuberculosis also came to light. In addition there is the important finding of 42 new cases of pneumoconiosis. This is not unexpected in a mining area but it is particularly useful in view of the vulnerability of this group to tuberculosis infection. The advisability of surveillance in this condition is shown by the fact, already referred to, that 5 new cases of tuberculosis occurred amongst patients already attending the Chest Clinic for this reason. Somewhat surprisingly no cases of cancer of the lung were found, the increasing prevalence of which is referred to elsewhere in this report.

It may be noted that 35 persons, 9% of those asked to attend for a large film, failed to visit the Unit again as requested.

Discussion.

On looking at Table 16 one sees that in 1958, 5,917 mass radiography examinations led to the discovery of 7 new cases of active tuberculosis, a case-finding rate of 1.2 per 1,000 examinations. That indeed was the rate for the whole of Cumberland for the year, and contrasts with the staggering rate of 8.4/1000 only five years previously in Ennerdale Rural District.

TABLE 16.

Mass X-ray Statistics.

Year	1952	1953	1954	1955	1956	1957	1958	Total
Number X-rayed	1,918	2,882	4,303	3,960	3,807	2,661	5,917	25,448
New active cases discovered by X-ray	19	24	29	18	12	8	7	117
Notifications during year	58	61	72	71	64	40	36	402

The reduction in the discovery rate is undoubtedly due primarily to the fact that fewer cases remain to be found. It is recognised that repetitive X-raying of the same population is increasingly less fruitful, and herein lies the value of breaking new ground. In this survey only 2 new cases were found among 3,731 previous attenders, whereas the 5 new cases amongst 2,186 new attenders represents a case-finding rate of 2.3/1000.

While the campaign was not a great success as a case-finding measure, due weight should be given to the other discoveries made. The importance of pneumoconiosis has been mentioned. Furthermore the campaign had a definite educational value due variously to publicity measures, talks, and Press reports. It may well be that new attenders, once having been examined, will continue to be X-rayed occasionally.

The fact that the largest number of people ever X-rayed in the District produced the smallest number of cases since mass radiography began, emphasises the need to use the M.M.R. Unit to the best advantage. The current cry for selective group radiography brings particular difficulties in a rural area; and even when the selected groups are well defined there remains the difficulty of securing attendances without compulsion.

The problem is with us now. At the same time, the District over the years has been well salted with tuberculosis, and set in this background are such employments as coal and iron-ore mining, clothing manufacture and shoe-making, which have been ill-favoured with the disease. At present the continuance of routine surveys seems to be justified, and the special campaign is reviewed as a useful additional step towards the eradication of tuberculosis.

APPENDIX

Calculation of population of survey area.

Rural District population (mid-1958) ...	29,050
No. of inhabited houses according to rate books	9,206
Population density (persons per house) ...	3.15
No. of houses included in survey (by census letters despatched)	5,588
Estimated population in survey houses, i.e. houses multiplied by population density	17,630
Population distribution : persons under 15 years number 23.3% (aggregate of rural districts of Cumberland, 1951 census) Deduct	4,108
Persons of 15 years and over, i.e. target population	13,522

VACCINATION AND IMMUNISATION

B.C.G. Vaccination.

There was an increase in the number of children eligible for protection against tuberculosis, but, as Table 17 shows, the percentage of acceptors has fallen yet further.

TABLE 17.

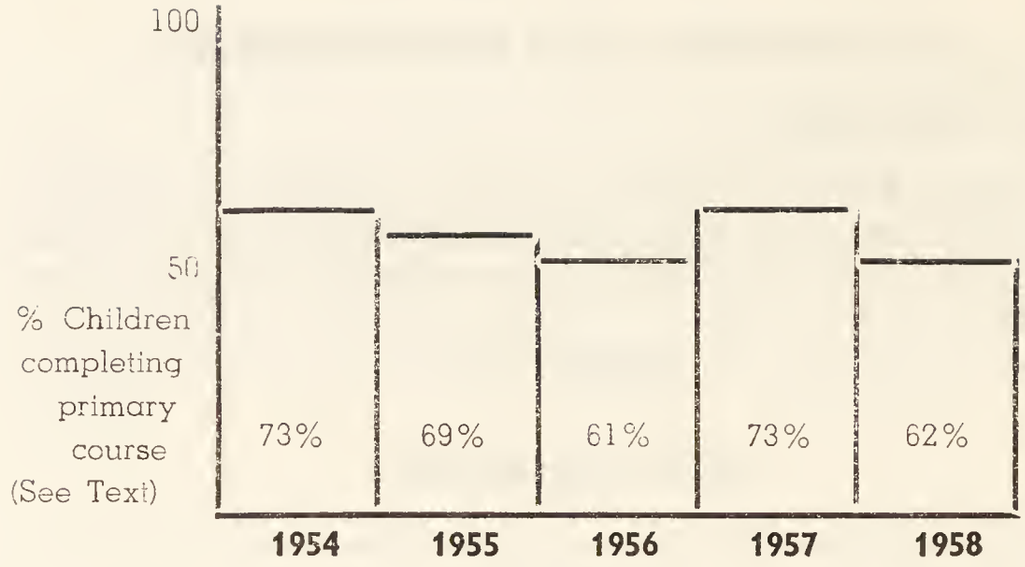
B.C.G. Vaccination.

Year	No. of children eligible for test	No. & %age of parents consenting	No. tested	No. & %age Mantoux positive	No. Mantoux negative	No. given B.C.G.
1955 ...	290	252 (87%)	244	98 (40%)	146	144
1956 ...	297	252 (85%)	235	98 (42%)	137	137
1957 ...	387	316 (82%)	311	114 (37%)	197	195
1958 ...	414	296 (73%)	284	101 (36%)	183	182

Diphtheria Immunisation.

The figure shows the numbers of children under five who completed a primary course of immunisation during the year, as a percentage of the births in the previous year. The numbers included of children over one year of age are very small, and a fair idea is given of the proportion of infants being immunised each year. Despite the approximate nature of this figure it gives earlier warning of any fall in the number of infants being immunised than does the diphtheria immunisation index. The latter, referring to a five year period, may alter only slightly even if many fewer children are being immunised; indeed it can even rise and give a false sense of security when immunisations are falling.

The 1958 figure for the District, though a reduction on the previous year, is not unsatisfactory in view of the competing demands of poliomyelitis immunisation. Furthermore, a number of mothers whose infants have had three injections against whooping cough have refused to submit the child to another two on account of a disease of which they know nothing or connect remotely with the past. In fact diphtheria increased in 1958, and there is no sign whatever that precautions against it can be relaxed.

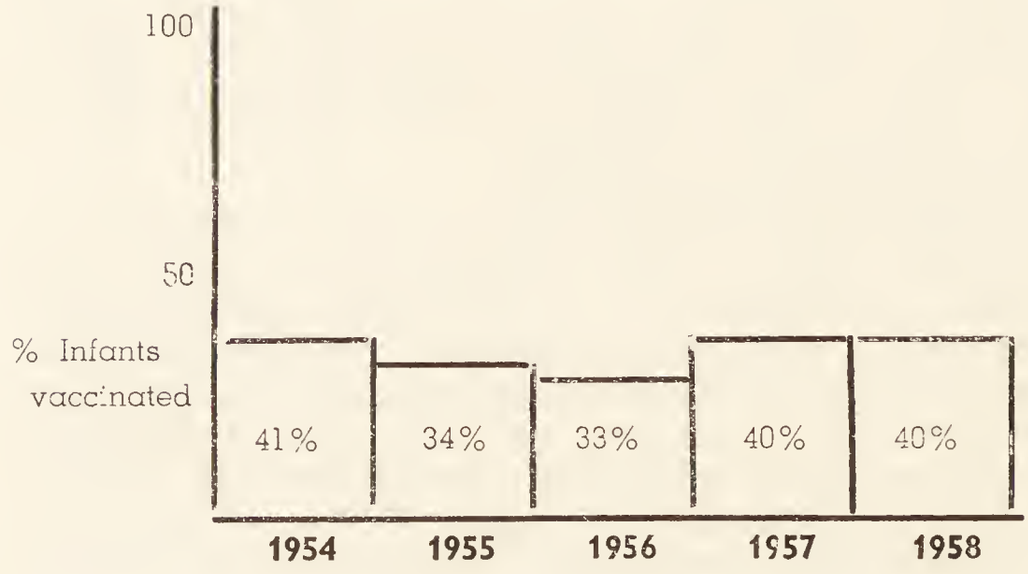


Pertussis Immunisation.

Immunisation against whooping cough was offered in County Council clinics for the first full year in 1958. Combined immunisation against diphtheria and whooping cough is not available except through the general practitioner. The necessity to submit the child to two separate courses of injections for protection against diphtheria and whooping cough may explain the poor response. Only 138, less than a quarter of the babies born in the year, were immunised against whooping cough.

Smallpox Vaccination.

The level of smallpox vaccination has been maintained and, indeed, has shown little variation in recent years. Although within sight of the national average acceptance figure of 44.5% one would like to see this bulwark against smallpox strengthened further. The local figures for the past five years are shown below.



Poliomyelitis Vaccination.

In the previous report it was stated that vaccine supplies had been poor and by the end of the year only 11.6% of eligible children had been immunised. Towards the end of 1957 the age groups were extended so that the year 1958 saw a much wider field of opportunity. Improved vaccine supplies now made possible a real attack on the huge task of protecting children up to the age of fifteen.

During the year, 1,957 out of 2,629 pre-school children and 4,528 out of 5,513 schoolchildren up to the age of fifteen received two injections, or 74% and 82% respectively. In the course of the year vaccination was extended to the 15-25 year-old group. This accounted for a further 425 persons protected. In addition, 228 expectant mothers were vaccinated and 260 "booster" (third) injections were given.

The number of protective injections given totalled 13,686 and most of these were given by the County Council's medical officers. The work done reflects credit on both medical and nursing staffs, together with those teachers who played a considerable part in carrying out the programme in schools.

REPORT

OF THE

CHIEF PUBLIC HEALTH INSPECTOR

PUBLIC HEALTH INSPECTOR'S ANNUAL REPORT
1958

Housing

The following shows the housing position and action taken during the year :—

A.	1.	Total number of occupied dwelling houses in the district	8,932
	2.	Total number of occupied dwelling houses subject to Demolition Orders, Closing Orders or Undertakings	56
	3.	Estimated number of houses (exclusive of above) which are unfit for habitation and cannot be made fit at reasonable cost	1,314
	4.	Estimated number of sub-standard houses (exclusive of above which could be repaired and made fit	2,239
	5.	Number of houses found to be overcrowded	17
B	1.	**Waiting Lists.** Total number of valid applicants on Council's waiting lists, exclusing of those living in houses under A. 2 and 3 above ...	468
C.		**New Houses Completed during the Year.**	
	1.	By or for the Council	168
		For aged persons ... ... nil	
		For agricultural workers ... nil	
		Flats ... ... nil	
		General purpose houses ... 168	
	2.	Private building	18
		Total ...	186
D.	1.	Number of houses for which application was made by private persons for Improvement Grants under the Housing Act, 1949	26
	2.	Number of houses for which grants were approved	23
	3.	Number of houses where improvements were carried out and grants paid ...	21
	4.	Number of houses purchased or taken over by the Council with a view to improvement or conversion	nil
	5.	Number of houses improved by the Council :	
		(i) with grant	nil
		(ii) without grant	nil

E. **Houses Demolished.**

In Clearance Areas.

	Houses Demolished	Displaced : Persons	Families
1. Houses unfit for human habitation	47	173	58
2. Houses included by reason of bad arrangement, etc.	nil	nil	nil
3. Houses on land acquired under Section 43, Housing Act, 1957	nil	nil	nil
4. As a result of formal or informal procedure under Section 17 (1), Housing Act, 1957	10	40	12

F. **Unfit Houses Closed.**

	Number	Displaced : Persons	Families
1. Under Sections 16 (4) 17 (1) & 35 (1) Housing Act, 1957	12	19	5
2. Under Sections 17 (3) and 26, Housing Act, 1957	nil	nil	nil
3. Parts of buildings closed under Section 18, Housing Act, 1957	4	16	4

G. **Unfit Houses made fit in which Defects were Remedied.**

	By Owner	By Local Authority
1. After informal action by Local Authority	313	nil
2. After formal action under		
(a) Public Health Acts	10	nil
(b) Sections 9 and 16 Housing Act, 1957	4	nil
3. Under Section 24, Housing Act, 1957	nil	nil

House Letting.

The rehousing of applicants for Council houses continues to be carried out on a points system.

Inspection and Supervision of Food.

(a) Milk Distributors :

Number of registered dairies ... 8

Number of registered distributors 21

(b) Sampling of Milk :

The scheme whereby the duty of the County Council of taking samples from the pasteurising plants was undertaken by the Public Health Inspector of the area continues.

Of the forty two samples taken for Phosphates and B. Coli tests from the two Pasteurising Plants forty were satisfactory.

Of the thirty five samples taken from distributors, twenty four were satisfactory. One sample for T.B. was taken, it was negative.

(c) Food Inspections :

The following table indicates the number and type of premises in the area to which the provisions of Section 13 of the Food and Drugs Act might properly be applied :-

Premises :	Number	Inspections
Butchers	20	23
Fishmongers and Poulterers	2	3
Greengrocers and Fruiterers	14	44
Grocers	133	140
Fried Fish Shops	12	9
Confectioners	19	12
Dairies	8	58
Restaurants and Food Preparing Premises	66	19
Ice Cream Premises		
(a) Manufacturers ...	1	5
(b) Retailers	68	43
Hotels and Inns	107	12
Bakehouses	16	38
Slaughterhouses	3	111
Street Vendors and Hawkers' Carts	—	4

Of the above premises twenty-eight are registered for the preparation or manufacture of sausages, potted, pressed, pickled or preserved food, and sixty-eight for the sale of ice cream. There is one registered manufacturer of ice cream in the area and he is considered very satisfactory.

Any contraventions of the Food and Drugs Act and Food Hygiene Regulations were suitably dealt with on the spot through co-operation with the persons concerned.

Five applications for the sale of ice cream were received, four of which were granted. Four samples of ice cream were taken, all of which were in Grade 1.

Condemned open food is dealt with by incineration, tinned goods are either opened and burnt or buried intact.

The following table shows the amount of food condemned as unsatisfactory :—

Commodity	Weight in Pounds
Meat	1,237½
Fish	26¼
Vegetables	46¾
Fruit	119½
Butter	6½
Milk	15¼
Soups	2
Cheese	36
Cereals	3¾
Preserves	1

(d) Slaughterhouses.

There are three slaughterhouses in the area, to which 111 visits were made.

The following table shows the number of carcases inspected and condemned :—

CARCASES INSPECTED AND CONDEMNED

	Cattle excluding Cows	Cows	Calves	Sheep and Lambs	Pigs	Horses
Number killed ...	74	2	—	220	84	—
Number inspected ...	74	2	—	220	84	—
All Diseases except Tuberculosis and Cysticerci						
Whole carcases condemned	—	—	—	—	—	—
Carcases of which some part or organ was condemned	3	—	—	—	—	—
Percentage of the number inspected affected with disease other than Tuberculosis and Cysticerci	4.05	—	—	—	—	—
Tuberculosis only						
Whole caracses condemned	—	—	—	—	—	—
Carcases of which some part or organ was condemned ...	—	—	—	—	—	—
Percentage of the number inspected affected with tuberculosis ...	—	—	—	—	—	—
Cysticercosis						
Carcases of which some part or organ was condemned ...	—	—	—	—	—	—
Carcases submitted to treatment by refrigeration	—	—	—	—	—	—
Generalised and totally condemned ...	—	—	—	—	—	—

(e) Meat Inspection.

The following table shows in tabular form diseases found other than Tuberculosis and the amount of meat affected and destroyed.

	Weigh in Pounds
Cirrhosis	9

Shops :—

There are three hundred and twenty shops in the area; one hundred and seventy one inspections were made.

Movable Dwellings.

There are five licensed camping sites in the area, and six applications to erect or station and use a moveable dwelling were received and granted. Forty-nine inspections were made and no offence called for other than verbal action.

Filthy and Verminous Premises.

Forty-one inspections were made to thirty-three houses. The method of dealing with verminous premises by supplying insecticides, instructing occupiers in their use and in general principle of hygiene continues.

Drainage and Sewerage.

Sixteen houses were converted from the conservancy system to water carriage :—

	Drained to :	
Parish	Main Sewer	Septic Tank
Arlecdon and Frizington	—	3
Gosforth	—	1
Haile	1	1
Moresby	—	4
St. Bees	—	1
St. Bridget	—	5
	1	15

Sanitary Conveniences.

New sanitary conveniences were erected in the villages of Gosforth and St. Bees.

Refuse Collection and Disposal.

Six refuse tips are in use within the area; these are situated at Langhorn, Bigrigg 2, Cleator Moor, Distington, Frizington and Moor Row.

Private contractors employed on the collection of refuse and privy contents have continued to deal with sixty five outlying properties distributed in the following parishes :—Egremont 6, Arlecdon and Frizington 45, Weddicar 4 and Moresby 10.

Water Supply.

A new reservoir was constructed at Hygiene Place, St. Bees and distribution mains laid in the Loughrigg, St. Bees and Coulderton districts.

Of the sixteen samples of water, as supplied to the parishes from the various sources subject to examination by the County Analyst, one sample from Ennerdale Lake, one from Meadley and one from Ennerdale Lake/Lamb Hill (mixed supply) were not regarded as satisfactory. A detailed report on the water samples taken will be found at the end of this report.

Particulars of the number of houses and the estimated population on public supplies are shown in the following table :—

Parish	No. of Houses	No. of houses supplied from Public Water Mains : (a) Direct	(b) Stand-pipe	Estimated Population Supplied
Arlecdon and Frizington	1,296	1,279	10	4,284
Cleator Moor	1,937	1,930	—	6,390
Distington ...	816	800	—	2,580
Egremont ...	2,111	2,109	—	6,207
Ennerdale and Kinniside	92	35	2	116
Gosforth	237	205	—	612
Haile	52	40	—	139
Lamplugh ...	220	199	2	658
Lowca	298	292	—	913
Lowside Quarter	130	63	—	189
Moresby	287	267	—	926
Netherwasdale ...	41	—	—	—
Parton	347	336	11	1,380
Ponsonby	26	23	—	81
Rottington ...	18	15	—	65
St. Bees ...	352	344	3	1,027
St. Bridget ...	184	154	—	764
St. John ...	447	442	—	1,457
Weddicar	120	103	10	457

The following table is a summary of inspections carried out not appearing in another part of the report and not calling for special consideration :—

Water Supply	432
New Drainage	193
Stables and Piggeries	4
Public Conveniences	3
Theatres and Places of Entertainment ...	1
Refuse Collection	7
Refuse Disposal	158
Building Byelaws	148
Nuisances	83
Sewerage	23
Number of houses inspected	1,073
Number of inspections made to houses ...	1,353
Enquiries in cases of Infectious Diseases ...	10
Visits re. disinfection	12
Miscellaneous Infectious Disease Inspections	9
Miscellaneous Inspections	583

FACTORIES AND WORKSHOPS

1. Inspection of Factories, Workshops and Workplaces.

	Number on Register	Inspections	Number of :- Written Notices	Prosecutions
(1) Factories without mechanical power ...	12	2	—	—
(2) Factories with mechanical power ...	80	48	—	—
(3) Other premises ...	1	—	—	—
Totals ...	93	50	—	—

2. Defects found in Factories, Workshops and Workplaces.

	Number of cases in which Defects were :—				
	Found	Remedied	Referred to H.M. Inspector	by H.M. Inspector	Prose-cutions
Want of Cleanliness	—	—	—	—	—
Overcrowding	—	—	—	—	—
Unreasonable Temperature	—	—	—	—	—
Inadequate Ventilation	—	—	—	—	—
Ineffective drainage of floors	—	—	—	—	—
Sanitary Conveniences :					
(a) Insufficient		—	—	1	—
(b) Unsuitable or Defective		—	—	3	—
(c) Not separated for Sexes	—	—	—	—	—
Other Offences	—	—	—	—	—
Totals	—	—	—	4	—

APPENDIX

Date	Source	Before or after Chlorination	Number of Colonies on Nutrient Agar after 72 hours at 37° C.	20/22° C.	Presumptive B. Coli Test after 72 hours	Clostridium Welchii Test at 44° C. in 40ml. after 48 hours
20-1-58	Wormgill	Unchlorinated	5 in 2	440 per ml.	Negative in 100 ml.	Negative
		Remarks : In view of the fact that this sample is derived from the Wormgill source, and is unchlorinated it would account for the high count on agar at 20-22° C. which is undesirable but in view of the excellence of the results in other directions it would be difficult to say that the sample representing this supply is not of satisfactory quality for human consumption, on the other hand it would certainly be advisable to apply chlorination to this source of supply.				
20-1-58	Ennerdale Lake	After	1 in 2 ml.	720 per ml.	Negative in100 ml	Negative
		Remarks : The only criticism in connection with this sample is directed to the excessive count on Agar at 20-22° C. Possibly the weather conditions existing at the time the sample was taken might have some influence but in view of the fact that there was a trace of Residual Chlorine it is difficult to explain this high incidence of organisms. It would be advisable to increase the chlorine dose and to have a further sample taken within a short period of time.				
27-3-58	Wormgill	Unchlorinated	3 in 2 ml.	2 per ml.	Negative in 100 ml.	Negative
		Remarks : Of good and wholesome quality.				
27-3-58	Wormgill) Meadley)	Unchlorinated After	1 per ml.	1 per ml.	Negative in 100 ml.	1 medium colony
		Remarks : Although the development of one medium colony in the Clostridium Welchii test may give rise to some doubt, in other respects the sample is of a high degree of bacterial purity and the supply it represents is of good and wholesome quality for human consumption provided that no deterioration is likely to occur.				

Date	Source	Before or after Chlorination	Number of Colonies on Nutrient Agar after 72 hours at 37° C.	20/22° C.	Presumptive B. Coli Test after 72 hours	Clostridium Welchii Test at 44° C. in 40ml. after 48 hours
21-3 58	Ennerdale Lake	After	4 per ml.	150 per ml.	Negative in100 ml.	Negative
		Remarks : Of good and wholesome quality.				
21-3-58	Owsen Fell	After	1 in 2 ml.	24 per ml.	Negative in 100 ml.	Negative
		Remarks : Of good and wholesome quality.				
8-3 58	Meadley	After	4 per ml.	7 per ml.	Negative in 100 ml.	Negative
		Remarks : Of good and wholesome quality.				
8-3-58	Cogra Moss	After	1 in 2 ml.	80 per ml.	Negative in 100 ml.	Negative
		Remarks : Of good and wholesome quality.				
15-4-58	Cold Fell	Unchlorinated	5 per ml.	6 per ml.	Negative in 100 ml.	Negative
		Remarks : Of good and wholesome quality.				
21-5 58	Gosforth Springs	Unchlorinated	3 per ml.	3 per ml.	Negative in 50 ml.	None
		Remarks : Of good and wholesome quality.				

Date	Source	Before or after Chlorination	Number of Colonies on Nutrient Agar after 72 hours at 37° C.	20/22° C.	Presumptive B. Coli Test after 72 hours	Clostridium Welchii Test at 44° C. in 40ml. after 48 hours
21-5-58	Ennerdale Lake) Lamb Hill)	After Unchlorinated	3 per ml.	1 per ml.	Positive in 30 ml.	None
		Remarks : The counts on Agar at both temperatures are satisfactory and the clostridium welchii test shows that there is no pollution by drainage with sewage or other undesirable sources, but the probable number of coliform organisms is in the order of 8 per 100 ml. of sample suggests some degree of contamination from the surface. The amount of chlorine added should be carefully checked and, if necessary, it should be increased.				
8-7-58	Cogra Moss	Unchlorinated	2 per ml.	765per ml.	Positive in 100 ml. Negative in 90 ml.	Negative
		Remarks : When judged by the results of the bacteriological examination although the count on Agar at 20-22° C. is rather high and the probable number of coliform organisms is of the order of 1 per 100 ml. of sample these circumstances are of no hygienic significance in an unchlorinated water.				
8-7-58	Meadley	After	9 per ml.	11 per ml.	Negative in 100 ml.	Negative
		Remarks : Of good and wholesome quality.				

County Analyst's Office,
Darlington.
17th February, 1958.

I hereby certify that I have analysed the undermentioned sample of water marked :—Sample of water from Station House, North Road, Egremont, which I received from Mr. R. M. Howells, Public Health Inspector, Cleator, on the 28th day of January, 1958, and that I find as follows :—

	Parts per 100,000
Chlorine as Chlorides	0.9000
Nitrogen as Nitrates	0.0629
Ammonia	0.0006
Albuminoid Ammonia	0.0018
Oxygen Absorption	0.0401
Injurious Metals	none
Total Solid Matter dried at 100° C. ...	5.0000
pH value of Sample	6.7
Temporary Hardness—None Degrees.	
Permanent Hardness—1.30 Degrees.	
Colour of Sample on Hazen Scale ...	2
Appearance of Sample in 2 foot tube	Not quite clear
Odour when heated to 50° C.	none

MICROSCOPICAL EXAMINATION

Small deposit from ½ gallon consisting of vegetable debris, earthy matter a few fungus growths and no apparent living micro-organisms.

OBSERVATIONS

This sample is of a high order of purity when judged by the result of the chemical analysis and the deposit is relatively small and without any hygienic significance.

Signed :—W. WALLACE
p.p. Cyril J. H. Stock.

County Analyst's Office,
Darlington.
14th May, 1958.

The following are the results of chemical analysis of a sample of water, received on the 2nd May, 1958.

Sample Marked :—Ennerdale R.D.C. 30.4.1958. 4-45 p.m. 8, Prospect Row, Cleator. Source—Meadley Reservoir, Chlorinated. Weather—Fine and warm.

Colour	silghtly yellow/brown
Appearanre	clear
Odour	earthy
Reaction, pH	6.5
	Parts per 100,000
Total Solids	8.0000
Nitrogen as free and saline ammonia	none
Nitrogen as albuminoid ammonia	0.0010
Nitrogen as nitrites	slight trace
Nitrogen as nitrates	0.10000
Chlorides, as Cl	1.50000
Oxygen absorbed from permanganate in 4 hours at 27° C.	0.1090
Bio-chemical oxygen demanded in 5 days at 20° C.	0.0500
Total Hardness	2.5500
Temporary Hardness	1.6000
Permanent Hardness	0.9500
Alkalinity	1.6000
Free chlorine	nil
Poisonous metals	nil

BACTERIOLOGICAL EXAMINATION

Number of colonies on Nutrient Agar at 37° C. after 72 hours	576 per ml.
Number of colonies on Nutrient Agar at 20-22° C. after 72 hours	1,400 per ml.
Presumptive B. coli test at 370° C. after 72 hours	Negative in 100 ml.
Clostridium Welchii Test at 44° C. after 48 hours	Negative
Residual Chlorine	None

OBSERVATIONS

The water has a noticeable earthy taste and, although it is stated to have been chlorinated, it contained no residual chlorine and was not sterile. It seems probable that a turn-over in the reservoir has occurred as a result of seasonal thermal changes, and that the water temporarily has a low dissolved oxygen concentration and an abnormally high chlorine demand. As I have no knowledge of the previous history of the supply, I can only suggest that the present chlorine demand should be ascertained by experiment and adjustment to give a residual of approximately 0.2 part per million after 15 minutes.

Signed :—W. WALLACE
p.p. Cyril J. H. Stock.

County Analyst's Office,
Darlington.
1st September, 1958

I hereby certify that I have analysed the undermentioned sample of water marked :—Sample from The Ridge, Wath Brow, Cleator Moor. Source—Cogra Moss Reservoir. Unchlorinated. Passed through high pressure filter. Weather—Cloudy with sunny periods, following some rain yesterday and heavy rain during previous days, which I received from Mr. R. M. Howells, Public Health Inspector, Cleator, Cumberland on the 27th day of August, 1958, and that I find as follows :—

	Parts per 100,000
Chlorine as Chlorides	2.2500
Nitrogen as Nitrates	0.0016
Ammonia	0.0083
Albuminoid Ammonia	0.0049
Oxygen Absorption	0.0160
Injurious Metals	none
Total Solid Matter dried at 100° C. ...	10.0000
pH value of Sample	6.5

Temporary Hardness—1.4000 Degrees

Permanent Hardness—1.6000 Degrees.

Colour of Sample on Hazen Scale ... 13 (Hazen 2 on filtered sample)

Appearance of Sample in 2 foot tube ... Not clear—Taste normal

Odour when heated to 50° C. ..... None

Iron 250 ml. = 0.1 mgm. = 0.04 p.p. 100,000

MICROSCOPICAL EXAMINATION

Large deposit from ½ gallon consisting mainly of ferric oxide together with a minute amount of earthy matter.

BACTERIOLOGICAL EXAMINATION

Number of colonies on Nutrient Agar at 37° C. after 72 hours ..... 26 per ml.

Number of colonies on Nutrient Agar at 20-22° C. after 72 hours ..... 37 per ml.

Presumptive B. Coli Test at 37° C. after 72 hours ..... Negative in 100 ml.

Clostridium Welchii at 45° C. in 40 ml. after 48 hours ..... Negative

OBSERVATIONS

The sample when judged by the results of the chemical analysis and bacteriological examination is of a satisfactory order of purity and free from excessive amount of nitrogenous constituents such as are usually associated with sewage or other undesirable drainage. There is a considerable deposit recorded under the microscopical examination which is largely hydrated ferric oxide and which, although of no hygenic significance, tends to give an unpleasant appearance to the water drawn from this supply.

Signed :—W. WALLACE

p.p. Cyril J. H. Stock.

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